

Appl. No. 09/401,701
Amdt dated April 22, 2004
Reply to Office action of November 4, 2003

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-8 canceled

9. (previously presented): A method for determining the position, velocity and acceleration of an object, comprising:

- providing a three dimensional fixed reference frame of known dimensions;
- providing an object, the position, velocity and acceleration of which are to be measured;
- generating electrical current from an oscillator;
- delivering said current from said oscillator to a power amplifier;
- directing said amplified current from said amplifier to a plurality of transmitters;
- generating a magnetic field from said transmitters in said reference frame;
- receiving said magnetic field signal from said transmitters into at least one receiver;
- demodulating and amplifying said received magnetic field signal into magnetic field components from said receiver signal, wherein said output from said amplifier is proportional to said magnetic field components;
- applying an extended Kalman filter utilizing a mathematical algorithm to said demodulated and amplified signal to calculate the position, velocity and acceleration of said object.

10. (original): A method as in claim 9, wherein said electrical current is selected from the group consisting of an alternating current source, a direct current source, a pulsed direct current source, and combinations thereof.

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11. (original): A method as in claim 9, wherein said mathematical algorithm mathematically models said transmitters as dipoles, said algorithm further uses total field and vector magnetic field mathematical components to calculate said three-dimensional position of said object.

12. (original): A method as in claim 9, further comprising placing calibrated magnetic field receivers at a known location in an uncalibrated transmitter geometry, wherein said algorithm determines the location of said transmitter in said fixed reference frame.

13. (original): A method as in claim 9, wherein said algorithm mathematically averages said signals from said receivers.

14. (original): A method as in claim 9, wherein said algorithm mathematically treats eddy currents generated in metal surfaces and objects nearby said transmitters as virtual magnetic field transmitters, said algorithm further calculating the position and orientation of said virtual magnetic field transmitters.